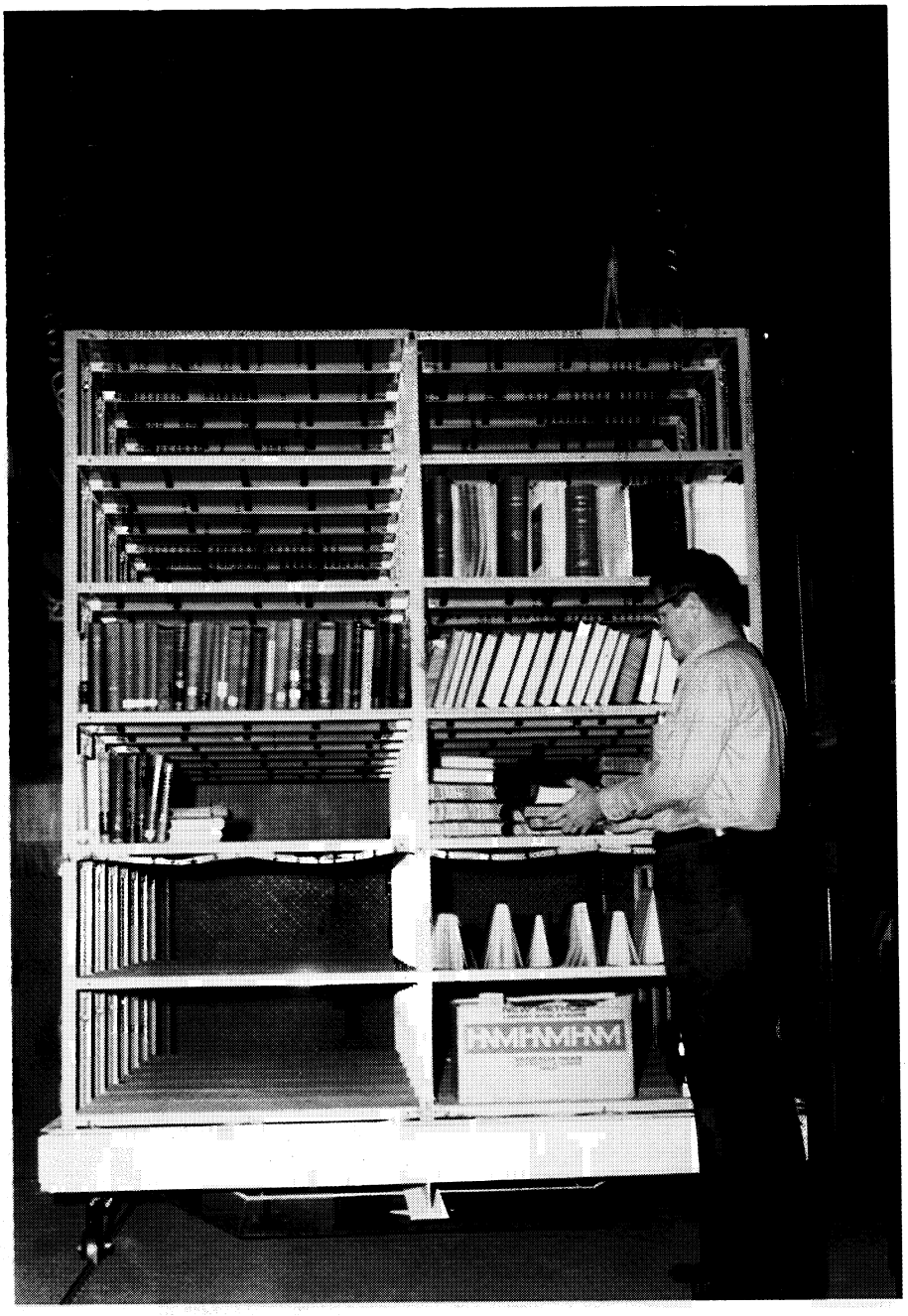


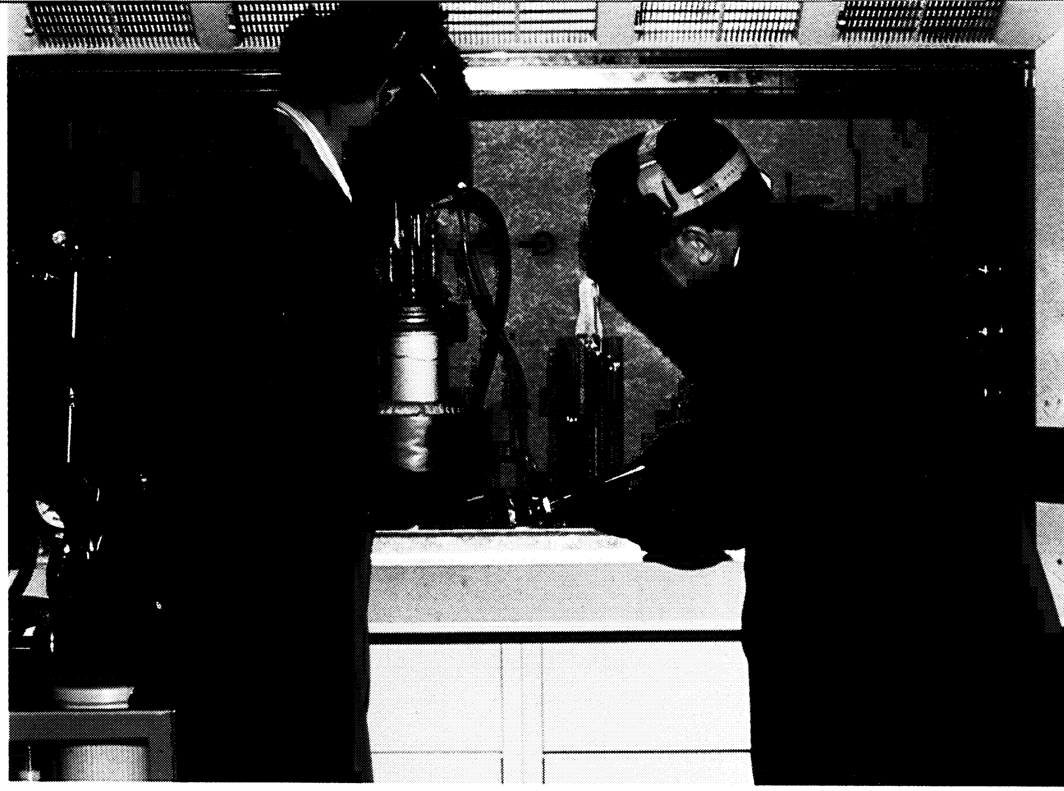
Book Preservation

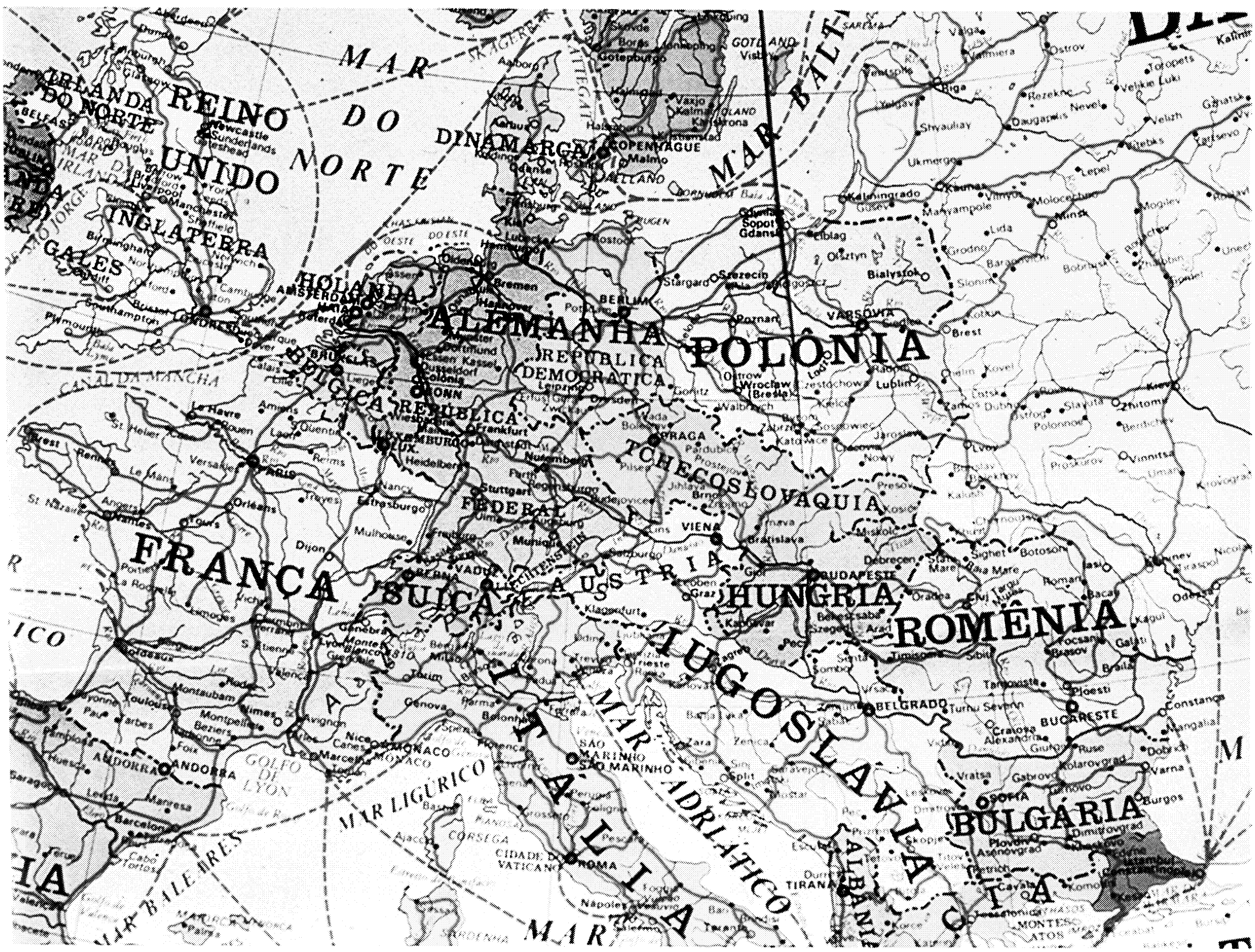
For several years, space vacuum chambers operated by NASA contractors—normally used to test spacecraft components—have been employed in a spinoff service: drying water-damaged books and other documents. In a program sponsored by the Library of Congress, the space chamber shown at left—operated by General Electric Company's Space Division, Valley Forge, Pennsylvania—is being used in a different but related manner; it is a facility for neutralizing the deterioration-causing acid content of valuable books in order to prolong their useful lives. Books produced since 1850 have a very high acid content, hence a shorter life expectancy than prior-published volumes. A means of "deacidifying" books on a large, economically-viable scale is of great interest, particularly to the research library community, which stores millions of valuable, often irreplaceable documents.

After years of research, the Library of Congress Preservation Office has developed an effective technique now considered ready for commercial application. The best deacidification agent found is diethyl zinc (DEZ), a highly volatile substance used as a catalyst in the chemical industry. The photo at upper right shows Library of Congress researchers carefully extracting DEZ from a sealed container in preparation for a deacidification test; they are working in a "fume hood" which would draw off the flame and noxious smoke that would result if DEZ were exposed to oxygen.

The General Electric vacuum chamber used in deacidification tests serves a dual purpose: it creates an environment in which the DEZ can do its job without the presence of oxygen, and it also dries the books, a preliminary step in the process; the extremely low pressure in the chamber causes evaporation of moisture. After the drying phase, DEZ is introduced to the chamber as a paper-penetrating vapor. The complete process typically takes eight days, four days for vacuum drying and four days of book exposure to DEZ.

Accelerated aging tests showed that the process can extend paper life almost fourfold. Deacidification has no detrimental effect on the paper, even on colored illustrations, as shown at right; half of the map was DEZ-treated, the other half not, and there is no difference in color. Library of Congress officials estimate that the process can be applied for less than three dollars per volume. The first commercial application is expected in 1980.

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